Claims

1. A method for fabricating of macroscopic two or three dimensionally ordered arrays of single wall nanotubes (SWNTs) comprising the following steps:

chemically treating purified SWNTs using known laboratory protocols, comprised of standard organic chemistry techniques, to add chemically reactive groups to either the tube ends or tube bodies in order to functionalize the SWNTs;

suspending the functionalized SWNTs in an appropriate liquid medium such that a colloid is produced;

treating the colloid with a chemical or heat to promote coupling of the individual functionalized SWNTs to each other; and

heating the coupled SWNTs to evaporate any excess liquid so as to provide a final product comprising an array of covalently bound functionalized SWNTs.

2. A method for fabricating of macroscopic two or three dimensionally ordered arrays of single wall nanotubes (SWNTs) comprising the following steps:

chemically treating purified SWNTs using the sol gel process to add chemically reactive groups comprising alcohols or amines to either the tube ends or tube bodies in order to functionalize the SWNTs;

suspending the functionalized SWNTs in an appropriate liquid medium such that a colloid is produced;

treating the colloid with a chemical or heat to promote the covalent bonding of the individual functionalized SWNTs to each other; and

heating the coupled SWNTs to evaporate any excess liquid so as to provide a final product comprising an array of covalently bound functionalized SWNTs.

3. The method of claim 1 including the addition of another substance; a polymer, epoxy, resin or ceramic material, such that the second material is added in a stable colloidal form to the colloid of carbon nanotubes, and after the steps comprising claim 1 are performed, a composite material is formed which consists of a two or three dimensionally ordered system consisting of carbon nanotubes and a polymer, epoxy, resin or ceramic material.

4. The method of claim 2 including the addition of another substance; a polymer, epoxy, resin or ceramic material, such that the second material is added in a stable colloidal form to the colloid of carbon nanotubes, and after the steps comprising claim 1 are performed, a composite material is formed which consists of a two or three dimensionally ordered system consisting of carbon nanotubes and a polymer, epoxy, resin or ceramic material.

5. The method of claim 1 further comprising this step utilizing a shear stress, electric and/or magnetic field on the gel produced by condensing either carbon nanotubes to themselves or carbon nanotubes to a polymer, epoxy, resin or ceramic material, such that alignment is promoted in the gel.